THE SOUND CONNECTION

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WHAT IS THE SOUND CONNECTION?

We're hoping that a lot of Production Managers at college radio stations will ask the same question and take a closer look at the Electronic Industries Association's new, double 12-inch disc package. (Once you're into it we know you'll be hooked.)

The "Sound Connection" is a complete "produce it yourself" kit, specially designed for the college radio format. The subject matter is SOUND. Good sound coming from audio equipment. . .and how to enjoy it.

The package contains pre-recorded interviews with experts from all over the audio field. They treat a variety of subjects. . .From the air suspension speaker design to tone arm tracking. Also included are original music themes, bridges, and tags. . .to add color and punch to the production and promotion of your own shows.

The HISTORY HIGHLIGHTS and AUDIO DEFINITIONS (printed materials) are great as random fillers in your everyday programming. We've even included fully produced EIA Public Service Messages. . . All ready to go on the air.

WHY PRODUCE A PACKAGE LIKE THIS FOR COLLEGE STATIONS?

The audio industry over the past several years have made available to the consumer an incredible variety of sophisticated home audio equipment. Advice on HOW, or perhaps generically WHAT, to buy is needed and requested by the consumer. Hence . . . . . .

AN EDUCATIONAL, CONSUMER ORIENTED, SEMI-PRODUCED SERIES OF PRE-PACKAGED PROGRAMS ON AUDIO EQUIPMENT, PRODUCTS, AND TECHNIQUES. . . . . .

. . . should be an effective and beneficial addition to your programming library.

1. THE INTERVIEWS provided are with some of the best informed people in the audio field. You *can* use the materials as provided but better yet, "edit in" your own station personality as announcer/interviewer *or*, using the scripts enclosed, produce your own shows with your own "experts".

2. THE MUSIC THEMES are produced in different formats to help you personalize the package. Use the vocal tags to promote your shows. Use the synthesizer bridges for continuity between tags and music beds. Use your imagination!

3. THE HISTORY HIGHLIGHTS and AUDIO DEFINITIONS (print) are bits of information that will fit just about anywhere. Use them as fillers during your shows *or* anytime.

4. CREDITS
   Gersh Thalberg, Superscope/Marantz

   Edward Myer, President of Myer Emco, audio retailer

   William Caulfield, TEAC Corporation of America

   Jerry Kalov, President of Jensen Sound Laboratories

   S. David Feir, V.P. of BSR (USA) Ltd.

. . . The Public Service Announcements included are excerpts from current EIA campaign directed to the consumer.

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EIA

The Electronic Industries Association (EIA) is the only national trade organization representing the full spectrum of electronic manufacturers in the United States. Its members range from manufacturers of the smallest electronic part to corporations that design and produce the most complex systems used in defense, space and industry.

Originally founded in 1924 as the Radio Manufacturers Association, EIA, through its 50 years of service to the electronic industries, has maintained a quick reaction capability to recognize problems which are common to the industry or segments of the industry, and to mount action programs leading to the solution of those problems. Because of its broad representation and its reputation for constructive action, EIA is nationally recognized as the spokesman for the electronic industries.

Electronic Industries Association

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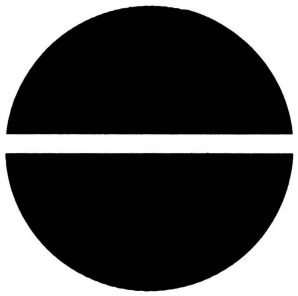


THE SOUND CONNECTION

Interviews

AS RECORDED CONTINUITY
Side A 1st Interview

MODERATOR: At the 1977 Summer Electronics Show held in Chicago, we talked to Mr. G.T. Thalberg, General Manager of Private Label Marketing and Sales for Superscope, Inc. We asked Mr. Thalberg to suggest a first step in shopping for a good high fidelity audio system.

THALBERG: I frankly feel that the best way for the consumer to determine true high fidelity is to go into a very fine high fidelity salon or store and listen to the very best high end components that they can possibly mass together and then work your system around that basic sound concept.

MODERATOR: Mr. Thalberg then commented on what the consumer could except to find on the market in the way of four-channel systems.

THALBERG: We do listen to mono-sound from time to time from certain old and fine records. Four-channel has had its good and bad days, and there is a great deal of confusion in four-channel, because we have had different systems. So, really, the sum and substance of high fidelity, in general today, is stereo - high fidelity.

MODERATOR: Taking into account personal tastes, Mr. Thalberg made this comment on the best overall type of sound to look for.

THALBERG: There are certain people that prefer a very live sound; other people prefer a subdued and very, very flat sound. Technically speaking, the flatter the response in a good acoustical

environment, the better off the overall system will be. Really, it's personal taste, but I think if one would look for the flattest possible system, with minimum coloration, that would really be best. You're not boosting highs, you're not boosting lows, nor are you tuning the system, so to speak. Now, I feel that a fine loud speaker system is the most important. The next dollar consideration is in the area of your amplifier or your receiver, and then from there, of course, it's your high fidelity record player and associated cartridge.

MODERATOR: In considering what type of basic system to buy, Mr. Thalberg began with those consumers who want good high fidelity but have a limited budget. For them, he had these encouraging words.

THALBERG: I believe here, that maximum consideration should be given to a quality home-music system of the compact variety. If the consumer or the customer shops carefully, in a compact system area, there are some very good ones on the market.

MODERATOR: To begin at the beginning of Mr. Thalberg's buying priority list, we asked for the best way to shop for speakers. Mr. Thalberg had this to say.

THALBERG: Try and go into a store or a high fidelity specialist who has a sound room that closely approximates the room which you are going to enjoy your system in. Look at the other furniture that he has around. Do they have a rug on the floor? Do they have

carpeting on the walls? Do they have an acoustical ceiling? Are the speakers placed at approximately the same height that you would have in your own home? Then take the fine speaker systems and put them together in an array where you can listen to them on a comparison. A/B testing is a must. Not only A/B testing, but I would say, A, B, C, D, E, F, and eventually, you will reduce it to a A/B situation where you will find the speaker that is good for you. You should also look for certain compensating adjustments on the speaker such as balance and brilliance control. Physical size is important. Are you going to put it in the corner? Are you going to put it on a bookshelf? Or, where are you going to use this particular speaker? Of course, again, budgetary considerations are extremely important. You're not going to go out and listen to a $1,000.00 system and try and get a $100.00 system to sound just like it. There are certain adjustments one must make.

MODERATOR: When purchasing an amplifier system, or receiver, Mr. Thalberg stressed compatibility.

THALBERG: I feel that compatibility is really the buy-word here. And, one should not go to a very esoteric pre-amplifier, let's say, and a very marginal power amplifier. Look at your specs. If you don't understand, get someone to interpret them for you, and keep good pricing parameters in mind when buying this type of equipment system.

MODERATOR: Now you have speakers and an amplifier system. So, we asked Mr. Thalberg for the best way to shop for a turntable to match your system.

THALBERG: Matching a turntable and shopping for a turntable are two different things. Almost any turntable will go into any system today, provided it's adaptable for a magnetic cartridge, or a high quality audio cartridge. A major consideration is the mechanics of the turntable. The turntable must have extremely low rumble. It must have minimum amounts of wow and flutter. Mechanically, it must be a sound mechanism; and it's personal preference as far as mechanical operation of the turntable.

MODERATOR: As far as accessory care and performance go, Mr. Thalberg had this word of caution.

THALBERG: Here we come up with a question as to the ability to be demonstrable in record care and tape care. Does it improve the performance? Some of the record care products I have seen do not really do what they say they do. Some of them do, and it's a question of asking around, making certain tests yourself, and reading certain reviews that can be helpful in determining whether or not these record-care kits or liquids or cloths or brushes or peazo-electric guns will do the job which you really want it to do. I would say, shop very carefully in this area. This is my professional recommendation.

MODERATOR: Once you have purchased your basic system, there is the matter of the best and most effective way to set it up in your home. We asked Mr. Thalberg for his recommendation.

THALBERG: I think the most important statement that I can make here is to read the instructions. Now, this may sound like a very basic answer, but people do not read the instructions. Now, the instruction booklets are to instruct the individual on the complexity or the features — the best way to use the equipment. And, it is really all summed up in those books and I recommend that everybody and anybody that buys equipment reads the instruction book before they do anything. And, in that particular way, they can get the most amount of enjoyment out of the product and for the longest period of time, because there are hints in there that have been derived from many years of experience by leading manufacturers.

MODERATOR: As a final point, we asked Mr. Thalberg to comment on up-grading a component system — just what constitutes up-grading and what is the best gauge to use for up-grading?

THALBERG: We're talking now, nonpackages. So, we have the turntable, the phonograph cartridge, the receiver or, in this case, the pre amp, the tuner, the power amp, and then the speaker system. We could consider any one of these points as being areas of up-grading, so that you unplug this in the chain of the high fidelity system, and then you place a new, more technically advanced product, in this particular chain and effectively, you have then upgraded

your system. The key question one must ask themselves is after they have upgraded, can they hear the difference? Now, if you can hear the difference, you have then upgraded. If you cannot hear the difference, well, then in your own mind, you have satisfied a need by "upgrading". But in high fidelity, the answer is to hear it. And, if you can hear it, then you've got it.

Side A 2nd Interview

MODERATOR: Mr. Edward Myer is President of Myer Emco, a major east-coast chain of top-line high fidelity audio salons. Since the most popular form for an amplifier unit today is in the receiver, we asked Mr. Myer to tell us what the elements of a receiver are and how they came to be developed.

MYER: When high fidelity first started, it was necessary to separate the amplifier from the preamplifier in order to get rid of hum. The same was true of tuners. As solid-state came about, that is, transistors, it became completely practical to put the preamplifier, the amplifier, and the tuner all on one chassis. And we call that unit a receiver.

MODERATOR: Many people confuse the power amplifier and the pre-amplifier for the same piece of equipment. Myer separated the two two for us — explained their functions.

MYER: The function of a preamp is to take the sounds, the very weak sounds from the phonograph, from the tuner, and various other

sound producing devices, and bring them up to a strength that can be amplified even more by the power amplifier. The sound goes into the preamplifier and you can adjust it to suit your individual taste and to change its character to suit the room in which you are going to do your listening. Then the sound is sent on to the amplifier and receives a big power boost and into the speaker and then into the room and into your ears.

MODERATOR: In shopping for an amplifier, Mr. Myer stressed certain points to consider.

MYER: As a consumer, I would look at the specifications very, very carefully. First, it is not power alone you should be looking for. You should be looking for power with low distortion. In high quality amplifiers, the distortion should be less than 1/10 of a percent, that's .1 percent. In moderate quality amplifiers, less than .3, and in low-cost amplifiers, less than .8.

MODERATOR: He then went on to talk about amplifier power output.

MYER: The amount of power needed is a function of how loud you are going to play it, the size and type of furnishings in the home, and the efficiency, or more technically correct, the sensitivity of the speaker. The amount of power for most speakers in moderate-priced systems in most homes is about 35 to 40 watts. Any more than that, you will get only slight improvements in the overall sound quality.

MODERATOR: Mr. Myer then went on to explain why anything over 40 watts in power output provided only slight improvement in sound. He goes on to point out that one of the most misunderstood things about power output of an amplifier is the fact that the human ear does not hear on a linear basis.

MYER: A decibel is the smallest amount of increase or decrease in the sound level that the human ear can detect under ideal conditions. It is a very tiny change. Three decibels, which is twice as much power, can quite easily be heard. However, it is not a very large change. To be twice as loud takes 10 times the power. A customer may feel that the difference between 100 and 200 watts is a great deal of difference. Actually, it's a rather small difference, it's only three decibels, which is the minimum amount the human ear hears comfortably.

MODERATOR: As far as matching a power amplifier to the speakers goes, Mr. Myer gave us this basic guideline.

MYER: The speaker manufacturers have a set of specifications. In those specifications is the amount of power necessary to drive the speakers properly in the average living room, or the average home. You take that power figure and match it to the power output rating of the power amplifier.

MODERATOR: From his years of experience, Mr. Myer went on to de-emphasize the importance of matching components.

MYER: Frankly, I think that the word matching is overworked. Any standard component, electrically, will match almost any other standard component. That is, almost any amplifier has the proper characteristics to drive almost any speaker.

MODERATOR: When asked what was important in shopping for an amplifier, Mr. Myer had this to say.

MYER: I think if I were buying an amplifier, I would go to a showroom where it is quiet and where you can listen to these amplifiers and listen from one to the other on the same piece of music. See which one is clearest. See which one allows you to hear the most music. See which one has this illusive quality in the high-fi we call transparency.

MODERATOR: In shopping for a tuner, Mr. Myer offered these guidelines.

MYER: In tuners, again, specifications tend to be somewhat difficult to use. The consumer should look for a high sensitivity rating, a low stereo distortion rating, and a low capture ratio. Again, I emphasize listen, not buying totally by specifications. Use the specifications as a general guide, but listen.

MODERATOR: Finally, we asked Mr. Myer to comment on whether it was best to buy the power amp, preamp, and tuner separately, or to buy them as a receiver unit.

MYER: There are economic advantages to buying them all in one. For a moderate priced stereo system, I think the consumer is well advised to buy a receiver. You get more for your money that way. It costs more money to build the preamp separate, the amp separate, and the tuner separate. However, when you get into the better, or more powerful equipment, it becomes physically impossible to get all this equipment on one chassis. So, if you're buying moderate-priced and low-priced stereo systems, I think a receiver is your buy. As the price climbs above the moderate level, then you should take a good look at the separates.

Side B 3rd Interview

MODERATOR: At the 1977 Summer Consumer Electronics Show held in Chicago, we talked to Mr. William Caufield, Director of Product Development for Teac Corporation of America. We asked Mr. Caufield to give us a general rundown of the various tape-deck systems on the market today.

CAUFIELD: We really have four systems: The open reel is the old original system. It's still around, and I suppose it will still be around for many years because it's still the best system. The advantage of reel-to-reel is it's faster speed and wider tape, therefore giving you better fidelity. One of the disadvantages of reel-to-reel is that you have to thread it like a sewing machine. The next system that was introduced, of course, was 8-track cartridge. The cartridge is a continuous loop system. It still utilizes the same width of tape as reel-to-reel, 1/4 inch wide tape. It

records at 3 3/4 inches per second, it was very, very handy for the automobile manufacturers in the mid-sixties up until the early seventies. It's a very inexpensive little transport to design and build, because a lot of the mechanism is actually in the cartridge itself. Being a continuous loop, you don't have to have a very complicated mechanism. Cassette is rapidly replacing 8-track. It utilizes tape, only half as wide as an 8-track cartridge. It's actually two little reels inside a piece of plastic. Cassettes' disadvantage is slow speed, very skinny tape. A new system that was just introduced is called L-cassette. It takes some of the advantages of reel-to-reel and some of the advantages of cassette. The width of reel-to-reel, the speed of reel-to-reel, but with the packaging convenience of cassette.

MODERATOR: We asked Mr. Caufield to set a basic guideline for buying the right tape deck to fit a particular system.

CAUFIELD: The rule of thumb is the wider the tape, and the faster the speed, the better the fidelity. However, we do a tremendous job of making something as small as a little cassette sound darn good considering how slow it is. A consumer literally has to make a decision on how good of fidelity does he want. He has to ask himself, what is the rest of the system going to be. Obviously, he's not going to need the ultimate in reproduction from a tape recorder with only, say, a $300.00 or $400.00 system. But, if he's invested $2,000.00 or $3,000.00 in a system and he wants to really demonstrate the ultimate recording and reproduction of his total system, then he should consider reel-to-reel or have both.

MODERATOR: We then asked whether there were any problem areas to look for when buying a tape deck.

CAUFIELD: The biggest problem with a tape recorder is the mechanics. Therefore, the first thing you look for is the mechanics. How well is it made? Electronics will follow. If a machine is mechanically well designed, by and large, it has good electrical characteristics, but you have got to get a good balance between the two.

MODERATOR: Mr. Caufield then commented on the more important specifications to look for in a tape deck.

CAUFIELD: Today we find that most cassette decks can record very easily 13, 14, 15 thousand hertz signal-to-noise, which is, of course, how loud can you record the tape without it distorting compared to how quiet the basic recorder is. The distance between those two measurements is the signal-to-noise ratio. The state-or-the-art decks today, are very, very good. It's very difficult to choose from one brand to another by pure specifications.

MODERATOR: Another consideration in selecting a recording system for personal use is blank tape. Mr. Caufield had this to say.

CAUFIELD: It's becoming quite a hassle for the consumer to buy a machine and then decide what kind of tape to buy because there's a tremendous amount of blank tape out. Fortunately, most manufacturers of recorders have a complete chart inside that we attempt to keep up with the various blank tape products that are coming out. So, we and the blank-tape manufacturers try to work very closely for matching up blank tape with machines.

MODERATOR: Finally, we asked Mr. Caufield to comment on future developments in tape recording in the audio industry.

CAUFIELD: Technically, I think that you'll see a lot of work done in the future in new methods of storing and retrieving. It can be something as exotic as a digital recorder — will record just digital information on tape. And, maybe someday, it won't even be tape we will be storing it on.

Side B 4th Interview

MODERATOR: At the 1977 Summer Consumer Electronics Show held in Chicago, we talked to Mr. Jerry Kalov, President of Jensen Sound Laboratories. We asked Mr. Kalov just how important cabinet design is in speaker performance.

KALOV: Frequently, people think it's just for cosmetic purposes, when, in fact, the cabinet contributes about half the sound to a speaker system. There are a number of different types of cabinet systems available. The most common of which are bass reflex, infinite baffle, and acoustic suspension.

MODERATOR: We asked Mr. Kalov to explain each of the three cabinet systems.

KALOV: Acoustic suspension is a sealed cabinet meticulously sealed so there are no air leaks and therefore, it contains all of the acoustic or sound pressure from the speaker within it. A bass

reflex is just the opposite. It has a carefully cut hole in it so all the air pressure is let out. And a folded horn is sort of a combination of the two.

MODERATOR: When we asked Mr. Kalov to compare the three systems, he had this to say.

KALOV: Acoustic suspension is necessary for good bass response in smaller type cabinets and is the most popular form of speaker system that's on the marketplace today. Unfortunately, when you make the enclosure smaller, you increase its bass response and tend to decrease its sensitivity or efficiency, hence, needing more power to drive it. Bass reflex generally, therefore, is more efficient than an acoustic suspension and a folded horn is somewhere in between those two.

MODERATOR: Having explained the role of cabinet systems in reproducing sound, Mr. Kalov turned to the speaker systems inside. First, explaining what a loud speaker does for an audio system.

KALOV: Fundamentally, a loud speaker is a device which converts electrical energy to mechanical energy, A loud speaker gets its impulse from an amplifier which starts out in some form of mechanical energy such as a record, which is a mechanical device. Record plays; pick-up arm picks it up through the needle, which is mechanical, converts it to many electrical amounts; it's amplified by an amplifier; sent to a loud speaker; the loud speaker interprets

this electrical energy into mechanical energy; the speaker moves mechanically back and forth, pushes air; the movement of air is, in fact, sound pressure that hits the ear drum; the ear drum converts it; and so the beat goes on.

MODERATOR: We then asked Mr. Kalov about the different types of speakers in a system.

KALOV: Fundamentally, we divide the acoustic reproduction ranges into three categories: Bass response, mid-range response, and high frequency response. The reason we do this is that the ideal speaker for reproducing bass response is just about the worst type of speaker for reproducing high frequencies. And, so, we try to break down the acoustic spectrum so that we can get efficient reproduction in each of the acoustic levels, bass response, which we use woofers for, mid-range, which we cleverly call mid-range speakers, and high frequencies, which we call tweeters.

MODERATOR: In explaining the three speaker types, how they coordinate, and their power demands, Mr. Kalov began with the two extremes.

KALOV: At the woofer end of the spectrum, or the low frequency, the objective is to move large quantities of air at very slow rates of speed. We measure the speed in what you call hertz. And when we say a woofer is capable of reproducing 20 hertz per second, it can move back and forth at a rate of 20 times per second.

Because we're moving at a very slow speed and we're trying to propagate low tones or move masses of air, we tend to need larger surfaces to do it. We have the greatest efficiency or sensitivity problems in the woofer areas. Hence, we have the largest magnet structure, usually, and we spend a lot of time and energy in making them high compliant so they'll move freely and offer a minimum amount of resistance in mechanical parts. When we get into tweeters, we have just the opposite problem. Here, we are asking a device to move at a very high rate of speed, frequently as much as 18,000 times per seond, which is usually considered the upper extremities. Boiling it back down, we want this tweeter to move very rapidly and to make something move rapidly, it must, of necessity, be as small as possible. Now you have the opposite problem. If you are going to make something very small, it's very difficult for it to handle power. So, if we're going to put a lot of power into the bass response, and a little power into the tweeter response, we must somehow develop a device which tells each of these speakers what it is we ask it do do. And, that's called a cross-over network. We develop an electronic network which separates the incoming signal and sends only to the woofer that which the woofer is capable of reproducing and only to the tweeter that which the tweeter is capable of reproducing.

MODERATOR: Mr. Kalov then discussed the mid-range speaker.

KALOV: There's a great deal of controversy as to where the woofer stops, the mid-range begins, and the tweeter begins. But, for

the sake of this discussion we'll say that a woofer is usually effective up to approximately 500 hertz, or 500 movements per second and a tweeter is usually most effective starting somewhere in the neighborhood of 6 or 7 thousand movements per second and that leaves a big potential gap. In two-way systems, we must, of necessity, allow the woofer to cover a broader range and so we designed it to have a little less woof and a little more mid. And the tweeter to cover a little more range and therefore tends to tweet a little less and gets down and overlaps so that we can get smoother response and reproduce the whole spectrum. Then we tend to introduce a three-way system which introduces a third speaker or mid-range speaker or a middler. Then our cross-over network gets more complex because now, instead of dividing the reproduction spectrum into two acoustic levels, it must divide it into three, sending the information to the woofer, then special information to the mid-range, and then special information to the tweeter.

MODERATOR: Many speaker systems have manual controls designed into their makeup. We asked Mr. Kalov about these.

KALOV: We introduce controls and/or switches into our loudspeaker systems to allow the consumer to change or shape the output performance of their loudspeaker to conform to their individual tastes. These tastes take two forms: One, that they are musical tastes, depending on the types of music they are interested in listening to, hard rock versus a very light classical and them, of course, we have all the music in between those two extremes. In addition to

the music preference, there is the environment in which the loudspeaker is reproducing, or the room acoustics. Does the room have carpet? Does it have drapes? Is it a big room? A small room? An open room? A closed room? Etc. As the loudspeaker sends its sound waves throughout the room, it bounces off the walls, off the floor, off the ceiling, in addition to off the ear. Then the ear not only hears the primary sound, which is usually heard most on axis, which means right in front of the speaker, but it also hears all the reflective sounds.

MODERATOR: We then asked Mr. Kalov if speaker systems had any other coloration features.

KALOV: Those of us who are in loudspeaker design try to design a loudspeaker to faithfully reproduce the music. We think that it is our objective to not color performance, but merely to take the recording as it was intended to be reproduced and reproduce it. Whatever coloration takes place, should take place in the recording mode and, of course, the consumer has an opportunity to do additional coloring through the controls that appear on the amplifiers: bass controls, treble controls, high filters, low filters, etc., depending on how sophisticated the equipment.

MODERATOR: On the subject of speaker specifications, Mr, Kalov had this to say.

KALOV: I think it is important that we understand the difference between high efficiency and high power. High efficiency/sensitivity is the loudspeaker's ability to reproduce sound with a minimum

amount of power on. So, we say a speaker is most efficient when we can put the fewest number of watts in it and get the most sound out of it. In the case of power handling, we have the opposite. Here, we're saying is how much power can I put in my loudspeaker before the loudspeaker can no longer handle it. It's a function of loudness as well as other factors. Where people are frequently confused is that an amplifier is capable of putting out a lot of watts, it doesn't necessarily mean it's going to be putting out a lot of watts all the time. Frequently, when it does put out a lot of watts, it puts it out only in the bass area. Unfortunately, when you build in more power handling, you tend to take out efficiency. Speaker manufacturers in the industry try to address themselves to both of these points by developing a loudspeaker that has the optimum balance between efficiency and power handling.

MODERATOR: Mr. Kalov went on to talk about another point confusing to the average consumer.

KALOV: One of the great confusions we have in the marketplace currently is the so-called power-rating factors in both amplifiers and loudspeakers. In amplifiers, power rating is a fairly definitive thing. We can measure it and say the amplifier is capable of putting out 50 watts or 40 watts or 100 watts, or what have you. In loudspeakers, we tend to rate a loudspeaker on its ability to handle power comfortably. It's not how much it generates, it's how much it can handle. The benefit of buying more power in

amplifiers is not necessarily to play louder, but to reproduce cleaner. In buying a loudspeaker, what you want to insure is that you can get good power handling so that you can satisfy your loudness requirements depending on your own individual tastes. The relationship to your room and the room acoustics is, of course, critical. The larger the room, the more power you are going to take to fill the room. What we call a live room would need far less power than a room that was heavily draped or had a lot of carpets in which we had a high rate of acoustic absorption in all of the surfaces.

MODERATOR: Mr. Kalov summed up the subject of specifications with this helpful shopping hint.

KALOV: The trick in buying equipment especially in loudspeakers is really to listen. The specifications themselves have very little value except on a relative basis. They in no way communicate the acoustic properties of the loudspeaker — its performance characteristics. So, you really should audition loudspeakers. The subjectivity of acoustic performance is total. It's entirely up to the individual buyer.

MODERATOR: Finally, we asked Mr. Kalov to comment on the future developments of speakers in the audio industry.

KALOV: Developments that have occurred throughout the years, primarily, are in power handling. Additional developments won't be specifically in the area of speakers, but they'll affect them.

The objective of good component reproduction has always been, and will always continue to be, to faithfully reproduce the ambiance of direct live performing. One of the things you cannot get in a stereo system is the complete ambiance. Some years ago, we were in a quadraphonic program in the industry, trying to reproduce all of those channels. That didn't work out well primarily because there wasn't sufficient software involved, and frankly, there was some debate in the industry to which system was best. There is now, a new type of system that is called time-delay in which we electronically synthesize the acoustic reflections of a concert hall. This, in conjunction with loudspeakers, will probably give us that which we have been searching for for many years.

Side C 5th Interview

MODERATOR: In New York, we spoke with S. David Fear, Vice President of BSR, USA Limited. Here is a brief summary of his philosophy relating state-of-the-art components to our way of life.

FEAR: I have seen the market for audio equipment grow dramatically, especially amongst the youth of the nation today. Now, we have to ask ourselves why. It's because people, youth, have been weaned on good sound and they want good sound at home. They are not satisfied with anything less than that good sound. And, if you think about it for a minute, it makes a lot of sense, because when they go to discos, what do they hear? They hear that good heavy sound. They go home, and if they don't have a good system,

they're not going to be happy with anything less than what they heard. Now, there's another aspect to it, too. Music is no longer a luxury, it's a necessity, it's a way of life. You take the records that the kids are listening to today. It tells a story. It's meaningful. Take all these concerts. They go there... they pack them in. Well, this is what the kids want. They want it at home. I've seen kids buying expensive equipment and sleeping on the floors of their own apartments. The first thing they want is their audio equipment. They go to college, they go to school, they want their audio equipment. It's not a status symbol, it's a way of life. That's what's important to remember. And, then, the reason that it's growing is because as they get older, and they have children, everybody's being weaned on this better sound and they're listening to this better sound, and they want this better sound. That means that the market will continue to grow appreciably. Now, in the matter of equipment, many people are trading up constantly, because they want this. They want better speakers. They want a better turntable. They want a better receiver. They want a better sound, better performance, and that's why the business is so dramatic today. From a marketing standpoint, it's got to continue to grow and those retailers and those people who address themselves to the youth of the market, this college market or youthful market, are going to find themselves with a tremendous amount of business to look forward to. There is one other aspect that I'd like to touch on here, too, which is vitally important and I almost missed it. As opposed to any other

item that people can buy today, please bear in mind that audio today represents one of the best values in the country, dollar for dollar. What I'm saying to you, is that people are buying better equipment today at less money today than they did 10 years ago. Now, if you factor in better equipment, an inflation rate of 50% over the last 10 years, think of what I'm saying. You've got a piece of equipment that they're paying $300.00 for or $400.00 for, should sell for 7 or 8 hundred dollars...factoring in those... the inflation rate and better equipment. So the consumer can go out and still get his dollar's worth with audio equipment. Look what happened in apartments, houses, cars; you're paying a lot more for everything, but not for audio equipment, which, again, is one of the reasons why this business is so dramatic...so fantastic and why people are able to go out and buy equipment at these prices, because they're really getting their money's worth and there's no other product you can name to me today where that same thing holds true.

MODERATOR: Mr. Fear talked to us about basis stylus types.

FEAR: There are three basic styli. There is the conical, elliptical, and the shebata stylus tips. Each one, of course, performs their own function and it's a question of one's needs. The shebata tip, because of its dimensional cut, will pick up the most information available in a record groove. This is important, because not only does the tip reach down, but the side-walls reach down and pick

up the information, but is limited, because it just reaches down into the groove itself. So, obviously, as you go from conical to elliptical to shebata, you will pick up more information in the record groove, providing it's there and providing that the manufacturer of the record has cut it to give you all that. You can, with the proper record and with the proper equipment, with the shebata stylus, pick up a lot of the overtones and information that you'd normally miss. Now, shebata styling came about because of CD-4 equipment, but it has not proliferated itself into regular high fidelity equipment, audio equipment, because people are going to realize that it has certain advantages. But, of course, it's more expensive, and, again, depends upon what suits one's purpose.

MODERATOR: Mr. Fear discussed criteria for selecting a turntable.

FEAR: Well, I think that it has to be looked at from an overall point of view. You have to look at what other equipment the person has. Then there are several criteria. One is a budget. I mean, that is very important. Look, if you've got $150.00 to spend, or 200 or 100 dollars to spend, I mean, you're not going to buy anything for $500.00. Then B, it's got to look good. It's got to please the particular person. You never know what triggers off anybody. C, a lot depends on the salesman who's selling the item. How convincing he is. Okay? You know how people are when they go into a shop, they get confused. They see a tremendous...a myraid variety of turntables. Even experts can get confused unless you

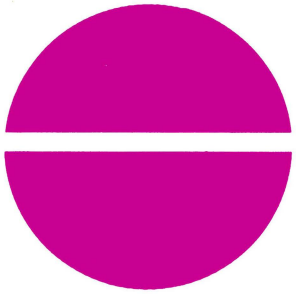
know in your own mind before hand. It depends on the shop, depends on the salesman, and as far as features are concerned, well, it should have basics. It should have que control, anti-skate. It should have a low tracking tone arm. These are basics. Beyond that, it's a question of design. It's a question of what meets the eye. But, I don't think there is a bad turntable. I think it's a question of graduations of good to very good to excellent and so forth.

MODERATOR: Mr. Fear then discussed the different types of drive systems for turntables. The advantages and disadvantages of each.

FEAR: Well, a belt-drive system takes a belt from the motor to a jockey-pulley, which drives the turntable. The only problem that happens with belt-drive is that they may have a tendency to slip, wear out, or break. Direct drive is the most effective way because there's nothing in between the motor and the turntable. The direct-drive unit drives the turntable. That's it. So that there is no slippage, no breakage, nothing that would give you any speed variation because it's a servo motor, nothing that would cause you any unusual rumbles or flutters or wow that you might get out of the other systems. But, again, it's a question of cost and what is applicable to a person's needs. Originally, direct-drive units were very, very expensive. You will find that they are coming down in price considerably. And, it will make it possible for people to be able to buy a direct-drive unit at a relatively

low price very shortly. It's a question of added features or just what the customer's looking for. Now there's something else that's just come up now and that's quartz lock loop which locks the turntable with a quartz semi-conductor, which, again is the state-of-the-art above the direct-drive, which is now coming into being. Now, again, all three systems are good: Rim-drive, belt-drive, and direct-drive. But, it depends of what the consumer is looking for, ultimately — what he wants.

MODERATOR: This program has been brought to you as a public service of the Electronic Industries Association and this station.



THE SOUND CONNECTION

History Highlights

HISTORY HIGHLIGHTS

1. In 1694, French poet Cyrano de Bergerac made the first known mention of the phonograph. He described the discovery of a "talking box", while on an imaginary trip to the moon.

2. The first working model of a phonograph was introduced by Thomas Alva Edison, in 1877.

3. Thomas Edison was 30 years old when he invented the first working model of the phonograph.

4. The first record was a grooved metal cylinder, wrapped in tin foil.

5. The first words ever recorded were those of Thomas Edison, rendering "Mary had a little lamb...", recorded in 1877 as a demonstration of his new invention.

6. The Edison Speaking Phonograph Company, the first company in the recording industry, was founded...and folded...in 1878. The phonograph, a year old, was too crude to market.

7. Edison, who invented the phonograph and formed the first recording company, folded the whole project within a year, thinking his invention had no practical future.

8. Thomas Edison's first major competitor in the fledgling recording industry was Alexander Graham Bell. Bell's American Graphophone Corporation introduced its variation of the phonograph in 1855.

9. The earliest phonographs were marketed as dictating machines, the latest in modern office conveniences. Between the crude, unreliable machines, and secretarial resistance, the industry was dying at an early age.

10. Columbia Records, the oldest continuously used trademark in the recording industry, began as a phonograph rental franchise attached to Jesse Lippincot's North American Phonograph Company, the industry's first distributor.

11. Louis Glass, manager of the Pacific Phonograph Company, in San Francisco, was the first to introduce the phonograph as an entertainment medium. He started his first Phonograph Parlor in 1890.

12. Phonograph parlors were the first use of phonographs as an entertainment medium. Customers paid a nickle to hear their favorite recorded musical and vaudeville comedy selections.

13. Columbia Phonograph Company became the leader in producing entertainment cylinders for use in the increasingly popular Phonograph Parlors or the 1890's. Volume was a brisk 300 cylinders a day, selling at 50¢ each or $5.00 a dozen.

14. In 1894, Columbia-Graphone introduced the first phonograph designed for use in the home...a spring-motored model which sold for $40.00.

15. At the turn of the century, German born Emile Berliner revolutionized the recording industry. His National Graphone Company introduced disc recordings and a redesigned machine to play them on. Cylinder phonographs were on their way out.

16. The Victor Talking Machine Company, formed by disc record inventor Emile Berliner and manufacturer Eldridge Johnson, in 1901, was the first company to make the total change from cylinder to disc recordings and machines.

17. Disc recordings were originally designed to play on one side. In the early 1900's, Columbia introduced the first two-sided disc for the American market.

18. By 1912, the only company still producing the overly-expensive, outdated cylinder recordings was the usually far-sighted inventor of the phonograph, Thomas Edison. Everyone else was into discs.

19. The last one into the field, Thomas Edison founded Edison Diamond Disc Phonograph, in 1929. Cylinder recordings finally became a thing of the past.

20. World War I was the Golden Age of the recording industry. The

American public was well-heeled and spending bunches on the latest in machines and recordings. Many of the old patents were expiring and new companies were forming left and right.

21. In 1924, electronic circuitry hit the market. Unfortunately, it hit the market in radio, and the phonograph recording industry hit the skids, while fledgling commercial radio became the craze.

22. Brunswick was the first company to put electric playback audio equipment on the market. It's first effort was the Panatrope, introduced in 1926. Victor followed, shortly after, with the Electrola, and acoustic equipment was on its way out.

23. In 1927, the Automatic Music Company of Grand Rapids, Michigan, marketed the first coin-operated, multi-selection record players. They came to be known as Juke Boxes.

24. The depression hit the recording industry hard. The record market was on rock bottom, when Prohibition was repealed. The bars re-opened, most of which had juke boxes, which not only consumed, but promoted records.

25. It was during the years after the Depression that E.R. Lewis, of England's Decca Record Company, founded American Decca Records... and opened the first channels for record distribution in chain and department stores.

26. In the mid-1920's, RCA Victor introduced the Duo, Jr., a small turntable designed to be jacked into radio sets. The Duo, Jr. might be considered the first piece of component audio equipment.

27. World War II was an interesting time for the recording industry. Public demand for new records and equipment was climbing, while the manufacture of electronic consumer products was suspended for full-scale war production.

28. Shellac, of which records were made at the time, was the biggest problem for the recording industry, during WWII. Most of the shellac had been imported from Singapore, which was in the hands of the Japanese.

29. It was during World War II, in the midst of halted consumer manufacturing and shellac shortages for record making, LA record store owner Glenn Wallach, and song-writer Buddy DeSilva founded Capitol Records.

30. The recording industry did benefit, in one area, from World War II. American engineers, following the Allied advance into Germany, were amazed at the high level of efficiency they found in tape recording.

31. The post-World War II discovery of advanced tape technology, in Germany fast led to the full development of tape as an entertainment

recording medium. Wax recording, which had to be done perfectly in one take, went out the window.

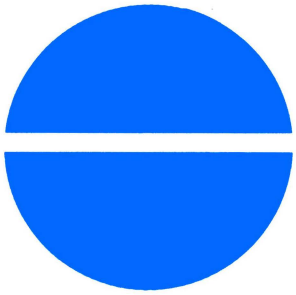
32. In 1948, Columbia Records hit the market with 12-inch long playing records and equipment that could play the new discs at the required 33 1/3 rpm. In 1949, RCA Victor came out with 7-inch discs that played at 45 rpm. Everyone else was playing 78's, and The Battle of the Record Speeds began.

33. The Battle of the Record Speeds raged well into the 50's, until a trend developed. 45's took over for singles, played in juke boxes. 33 1/3 LP's took over everything else. 78's were out of style.

34. Up until the post-World War II years, most recordings were in the pop and classic fields. The development of longer playing albums and tape recording methods broke the field of music wide open.

35. In the early 1950's, at the beginning of the hi-fi era, television swept the nation. Both the recording industry and radio took a nose dive, and "found" each other. Radio stations took up music formats, which boosted their audience and sold records for the industry. The two have been together ever since.

36. In 1958, Audio Fidelity marketed the first stereo recording. The battle between standard monaural hi-fi and the new stereo lasted almost ten years, before stereo became so widely used that the issue, and monaural hi-fi finally died.



THE SOUND CONNECTION

Audio Definitions

AUDIO DEFINITIONS

1. A-B TEST: A method of evaluating the relative performance of two or more components or systems by switching quickly from one to the other.

2. ACOUSTIC FEEDBACK: Annoying low-frequency interference created when vibrations from loudspeakers are picked up by the phono cartridge, then amplified by the sound system.

3. AIR SUSPENSION: A speaker design permitting good bass reproduction from a relatively small-sized enclosure, in which a sealed volume of air helps determine speaker-suspension characteristics.

4. ALIGNMENT: In tape recorders, the correct position of the gap in a tape head with respect to the magnetic tape for best response.

5. ALIGNMENT: In tuners, adjustments in various circuit stages permitting a full, undistorted signal to travel through the set.

6. AM: (Amplitude Modulation) The most common form of radio broadcasting. Standard AM radio broadcasting has some defects limiting its value for hi-fi listening, including limited frequency response and sensitivity to interference. AM stereo is being tested for possible future use in radio.

7. AMPLIFIER: An electric device for magnifying, and usually controlling, electrical signals. Hi-fi amplifiers consist of a pre-amplifier/equalizer section plus a power, or basic, amplifier section. In an integrated amplifier, both sections are built on one chassis and made available as a single unit. Or, the two sections may come in separate units.

8. ANTENNA: A section of wire or a metallic device designed to intercept radio waves and convert them into an electrical signal for feeding to a receiver.

9. ANTISKATING: An arrangement, generally mechanical, intended to defeat the tendency of a pivoted phono tonearm to drift toward the center of a record. It is accomplished by applying an adjustable force to push the arm outward, causing the stylus to contact both walls of the record groove equally.

10. BAFFLE: The panel on which a loudspeaker is mounted, usually the front panel of the enclosure housing the speaker.

11. BASS REFLEX: A type of speaker enclosure in which the speaker's rear wave emerges from an auxiliary opening, or port, to reinforce the bass (low) tones.

12. BIAS: A high-frequency signal applied to a tape recording head simultaneously with the audio signal to offset the effect of

hysteresis in the core of the head. The exact amount of bias depends of the tape formation, and ideally the adjustment should be made for each type of tape used.

13. CAPSTAN: In a tape recorder, a rotating shaft from the motor which moves the tape at a constant speed.

14. CARTRIDGE: A record-playing cartridge, or pickup, is a voltage-generating device with a stylus assembly.

15. CASSETTE: A small plastic housing enclosing a length of tape and two reels (supply and take-up) and incorporating openings for the heads and the tape-drive mechanism.

16. CD 4: A phonograph record storing four channels of discrete sound.

17. CHANGER: An automatic turntable which plays several records in sequence automatically. It consists of a turntable and arm plus a record stacking and dropping mechanism.

18. CHANNEL: A complete sound path. A single-channel, or monophonic system has one channel. A stereophonic system has at least two full channels, designated as "left" and "right". A quadrophonic system has four channels.

19. CHANNEL SEPARATION: The degree to which the left and right channels in stereo are separated. Inadequate separation can lessen the stereo effect -- excessive separation can exaggerate it beyond natural proportions.

20. COMPONENT: A specialized piece of equipment designed to do a particular part of the work in a sound system.

21. CONTINUOUS POWER: The amount of power each channel of an amplifier can deliver when fed with a continuous sustained tone.

22. CROSSOVER: A frequency which is the separation point for frequencies above and below it. In a two-way speaker system, for example, the cross-over frequency is the frequency at which the woofer and tweeter response are divided.

23. CROSSTALK: Signal leakage between two channels.

24. DAMPING: Controlling of vibrations, response or resonances which if unchecked would cause distortion.

25. DECIBEL or (db): A numerical expression of acoustical or electrical ratios, such as the relative intensity of a sound or the relative strength of a signal. One decibel is about the smallest change in sound perceptible to the ear.

26. DISCRETE: Four-channel sound handled without conversion to two channels, four independent sound sources on tape, or record played back through two stereo amplifiers into four speakers.

27. DISPERSION: Distribution of sound from a speaker over an angle into a listening room.

28. DISTORTION: Unwanted noise, or sounds which did not exist in the studio when the original recording was made. All distortion is undesireable.

29. "DOLBYIZED" TAPE: A prerecorded tape made using the Dolby noise-reduction process. Such tapes should be played back only on machines equipped with Dolby playback circuitry for accurate frequency response.

30. EFFICIENCY: The ratio, expressed as a percentage, of signal output to input, most often used to determine the power needed to drive a loudspeaker.

31. ENCODING: A process for conveying additional information without disturbing the original format.

32. FIDELITY: The degree of faithfulness to the original sound, implying minimum distortion and uniform frequency response.

33. FILTER: A circuit which attenuates signals above, below or at a particular frequency.

34. FLUTTER. Short, rapid variations in the speed of a turntable or tape transport, causing a wavering of musical pitch when severe.

35. FM: (Frequency Modulation). A form of radio broadcasting characterized by wide-range audio response and considerable freedom from noise.

36. FOUR-CHANNEL: A system of sound reproduction consisting of four separate signal paths from microphone to loudspeakers (discrete system) or one which simulates separate channels by matrixing to carry the same information on only two channels.

37. FREQUENCY RESPONSE: The ability to reproduce a given range of frequencies. The generally accepted high-fidelity range is 20 to 20,000 Hz.

38. HARMONIC DISTORTION: Unwanted noise in the original relationship between a tone and other tones naturally related to it.

39. HUM: Unwanted low-frequency noise from the power line.

40. IHF: (Institute of High Fidelity). A organization, founded by American manufacturers of hi-fi equipment, devoted to the improvement of audio technology, standardization of test and measuring methods, etc. In audio specifications, "IHF" means values were obtained from measurements made according to IHF standards.

41. IMPEDANCE: The total opposition to the transfer of energy. i.e., the load into which a circuit or electrical or acoustical device works.

42. INTEGRATED CIRCUIT or (IC): A combination of transistors, diodes and resistors, assembled in a prepackaged circuit, capable of providing high gain, low distortion and easily controllable performance in an extremely miniaturized form.

43. INTERMODULATION DISTORTION: Unwanted new tones caused by the mixing of two or more original tones.

44. MATRIX: A circuit used to add or subtract signals. The circuit used for encoding four related sound sources into two channels on tape or disc, requiring a matrix decoder to retrieve the original four channels.

45. MONITORING: Listening to sound during recording to judge or control the sound quality.

46. MONOPHONIC: (Mono). Single-channel sound.

47. NOISE: Any extraneous sound or signal intruding into the original as a result of environmental noise, distortion, hum or defects in the equipment.

48. OVERLOADING: Feeding into a system a signal that exceeds its capability.

49. PHASE DISTORTION: Unwanted noise disturbing that natural timing sequence between a tone and its original overtones.

50. PICKUP: A record-player cartridge.

51. PREAMPLIFIER: The first stages of an amplifying system, to equalize and boost low level signals, such as those from a magnetic record-player pickup or a tape head.

52. QS: A matrixing technique for encoding four-channel sound into two channels.

53. QUADRAPHONIC: The generic name for four-channel systems, either discrete or matrix.

54. RATED POWER OUTPUT: The maximum power an amplifier will deliver without exceeding its specified distortion rating. Also called Continuous Power Output or RMS.

55. SQ: A matrixing technique for encoding four-channel sound into two channels.

56. STEREO: Short for sterephonic sound, a multi-channel sound system or recording with each channel carrying an independent version of the total original performance. At least two channels are required for playback.

57. STYLUS: The part of a record-player cartridge that engages the record groove.

58. SYNTHESIZING: A technique for obtaining four-channel effects from existing two-channel material.

59. TAPE DECK: The basic assembly of a tape recorder, consisting of the tape moving mechanism (the tape transport) and a head assembly. Most decks also include recording and playback preamplifiers.

60. TONE ARM: The pivoting arm of a record player that extends over the record and holds the cartridge in place.

61. TRACKING: Following the undulations in a record groove, by the stylus in a cartridge.

62. TRACKING ERROR: The angular difference between the straight line across a record made by the cutter in production and the arc described by a pivoting tone arm.

63. TRACKING FORCE: (stylus force). The downward force made by the stylus on the record, measured in grams.

64. TRANSIENT DISTORTION: Unwanted noise disturbing the precise attack and decay of a musical sound.

65. TRANSIENT RESPONSE: The ability of an amplifier, cartridge or speaker to follow sudden changes in the sound level.

66. TUNER: A radio-receiving circuit. A hi-fi component containing such circuits.

67. TURNTABLE: The round platter on which a record rests during playback. A hi-fi component consisting of the platter, its driving motor and associated parts.

68. TWEETER: A loudspeaker designed and used for high-frequency sounds.

69. WATT: A measure of electrical or acoustical power.

70. WOOFER: A low-frequency speaker specializing in bass reproduction.

71. WOW: Slow, repeated variations in the speed of a turntable or tape transport, causing audible variations in musical pitch if severe.

Dear Sir:

Your special series of public service radio spot announcements was received by this station.

PLANNED USE: _____

_____

COMMENTS: _____

_____

_____

NAME: _____ TITLE: _____

STATION: _____ (AM) (FM)

CITY: _____ STATE, ZIP: _____

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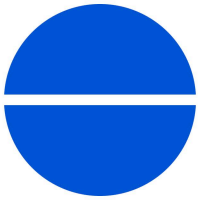

SIDE A
33 1/3 RPM

COMPATIBLE
AAVP 77182

INTERVIEWS

1 Thalberg - Shopping	8:47
2 Myer - Amps/Tuners	6:57

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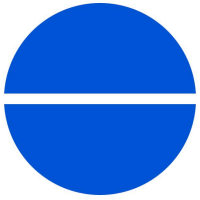

SIDE B
33 1/3 RPM

COMPATIBLE
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INTERVIEWS

3 Caulfield - Tapes and Tape Decks	4:37
4 Kalov Speakers	11:06

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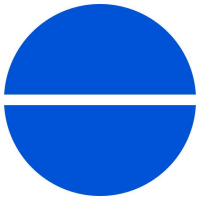

SIDE C
33 1/3 RPM

COMPATIBLE
AAVP 77182

5. Fear - Turntables (Interview)	9:10
6. "EIA PROMO"	:07
EIA Public Service Announcements	
7. Donna Summer	:30
8. Donna Summer	:10
9. Shopping Tips	:30

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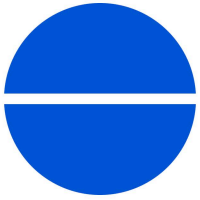

SIDE D
33 1/3 RPM

COMPATIBLE
AAVP 77182

10. - 17 Vocal Stings (8 cuts)	
18. - 25 Moog Bridges (8 cuts)	
26. MOR Theme	:58
27. Black/Soul Theme	:55
28. Country Theme	:45
29. Rock Theme	1:05

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